



# Changes in Residential Hot Water Use and Opportunities for Savings

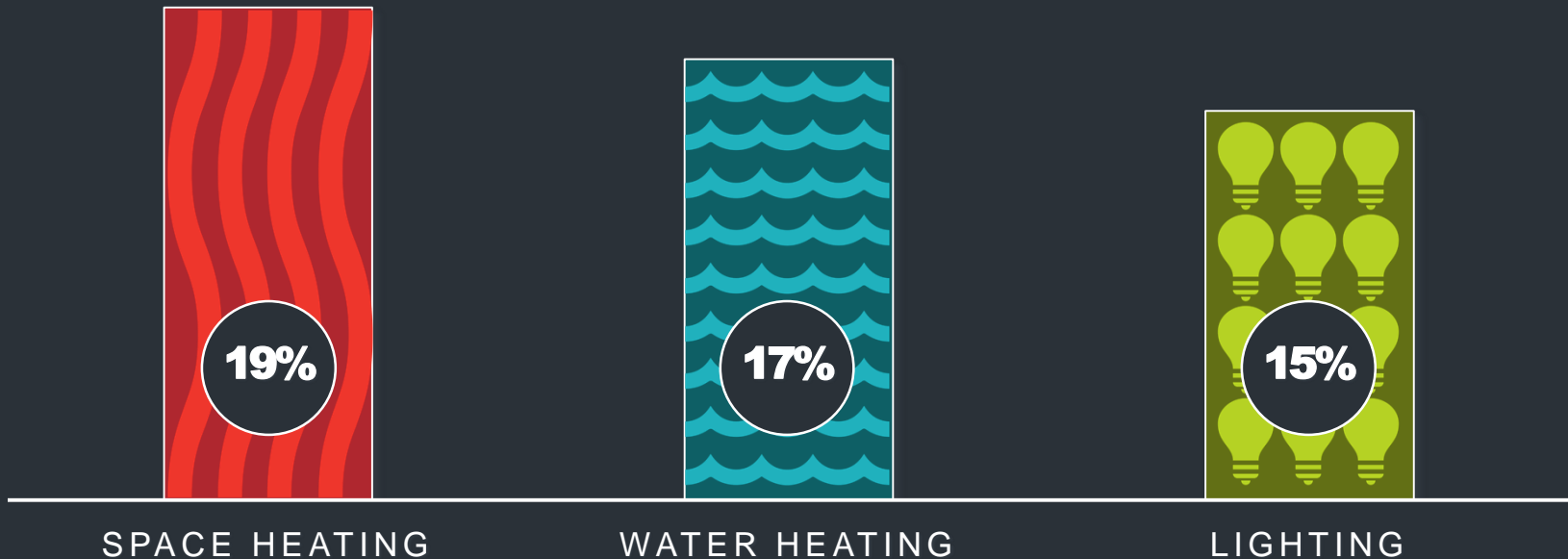
ACEEE 2018 Hot Water Forum

Portland, Oregon

# Why is hot water important?

It is the second largest residential end use in the Northwest

PERCENT OF 2015 NORTHWEST RESIDENTIAL LOAD (aMW)

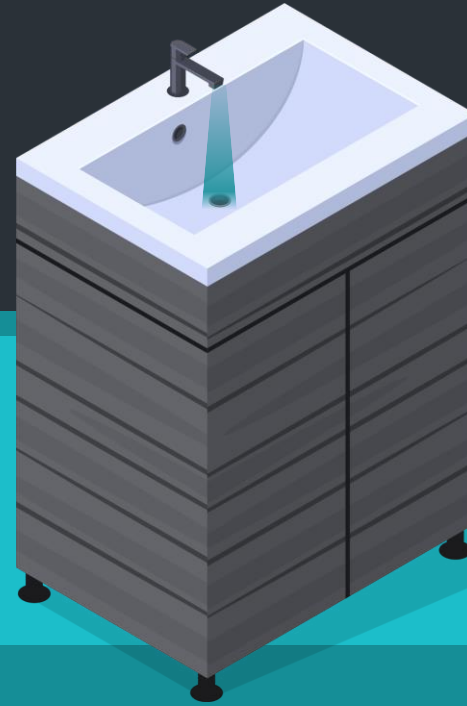


**We can think about the hot water market in two ways:**



**1**

or



**2**

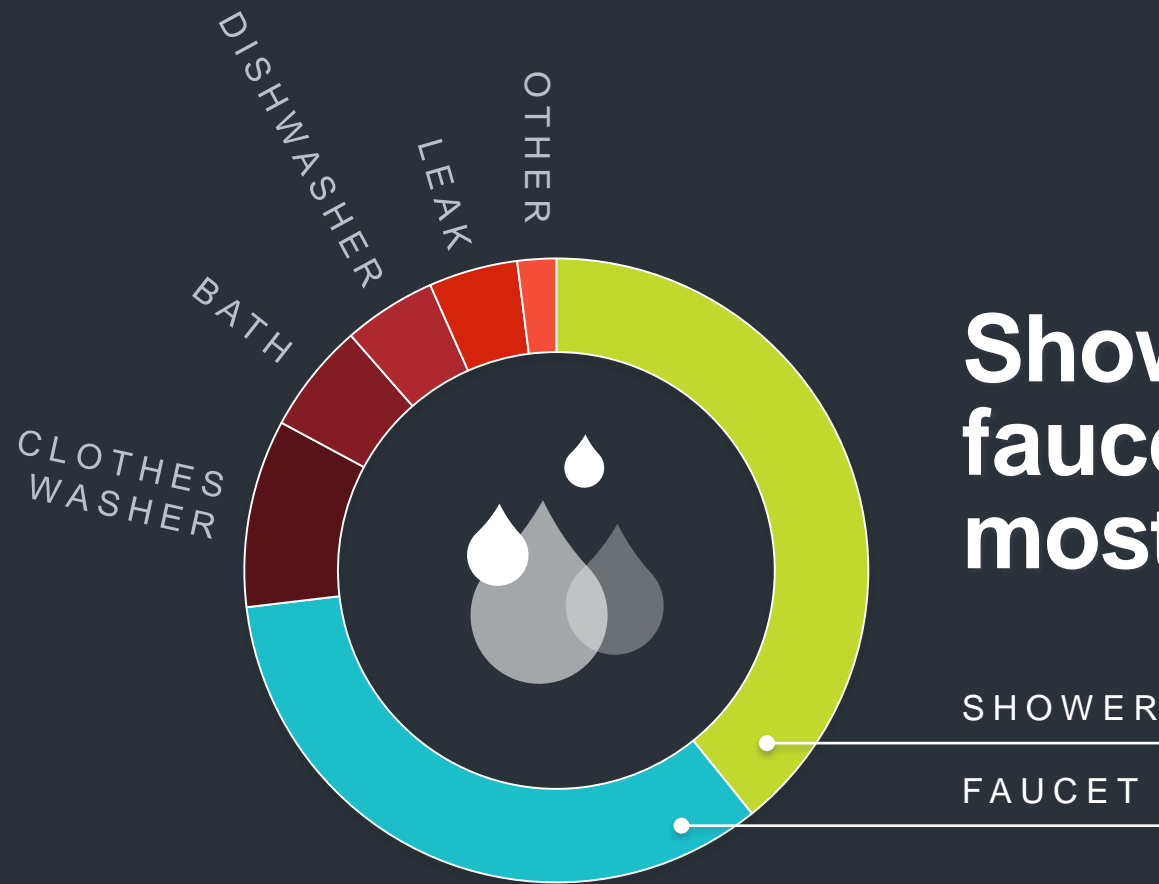
Water  
heating  
efficiency

Hot  
water  
use

**This session is focused  
on hot water use**

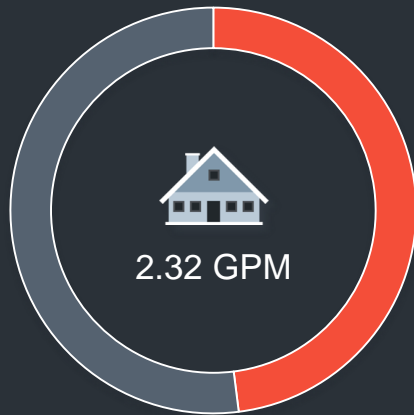
**How do  
people use  
hot water?**



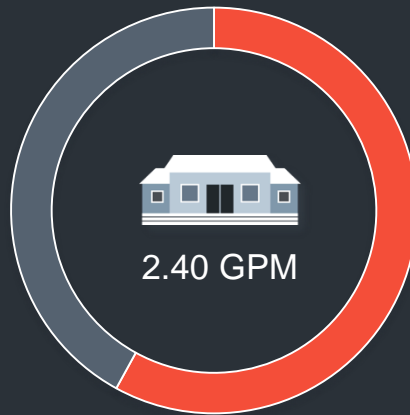


# Showers and faucets use the most hot water

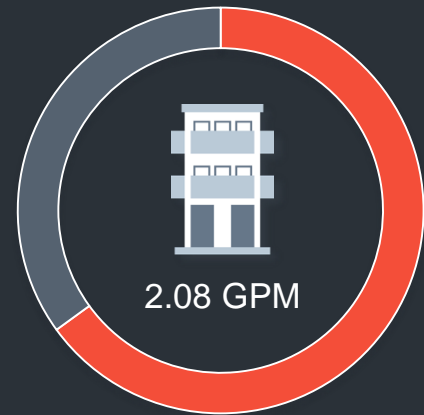
# Lots of inefficient showerheads



SINGLE FAMILY



MANUFACTURED  
HOMES



MULTIFAMILY

■ At or Below WaterSense ( $\leq 2.0$  GPM)

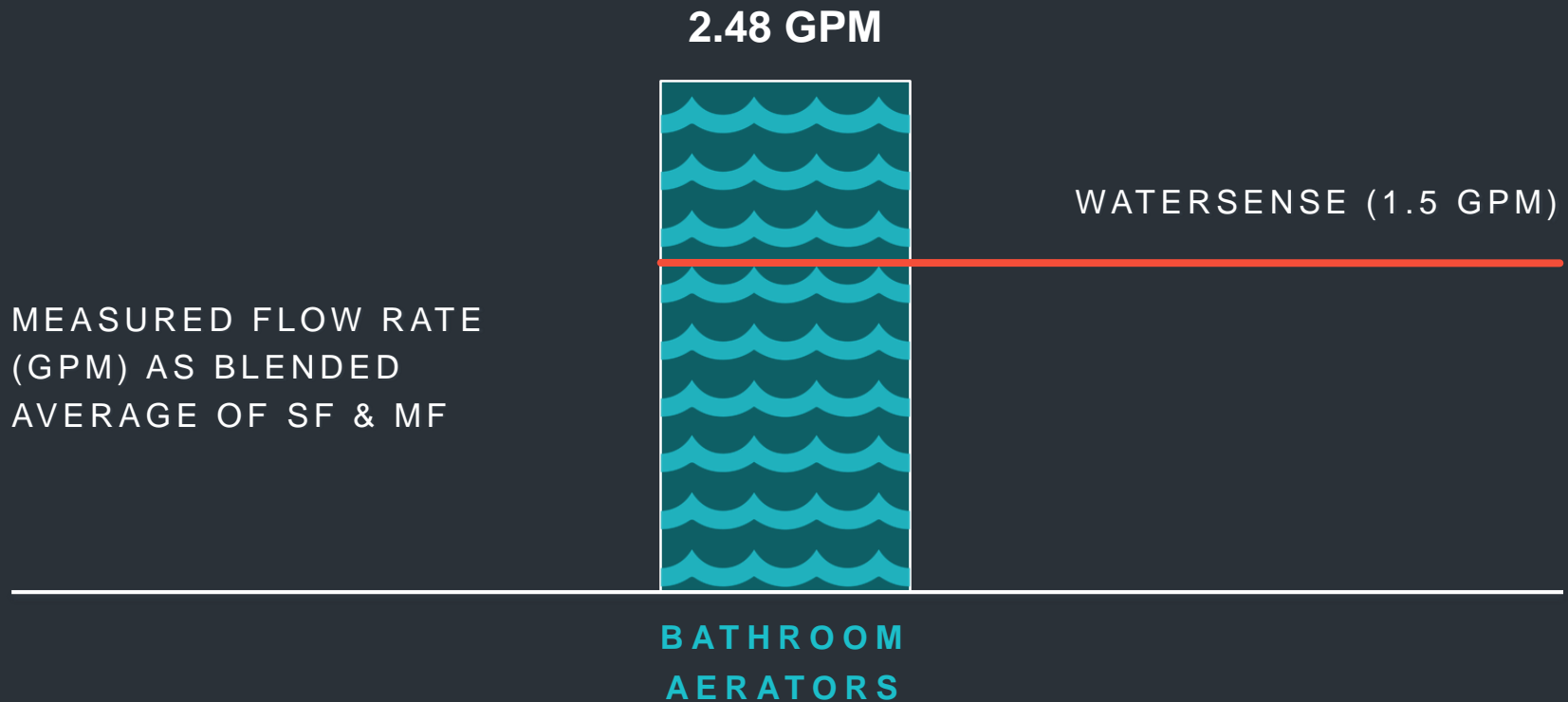
■ Above WaterSense ( $\geq 2.1$  GPM)

Source: 2011 NEEA RBSA

Note: GPMs shown are weighted average measured flow rates for each building type.

# Lots of inefficient bathroom aerators

Most not meeting WaterSense

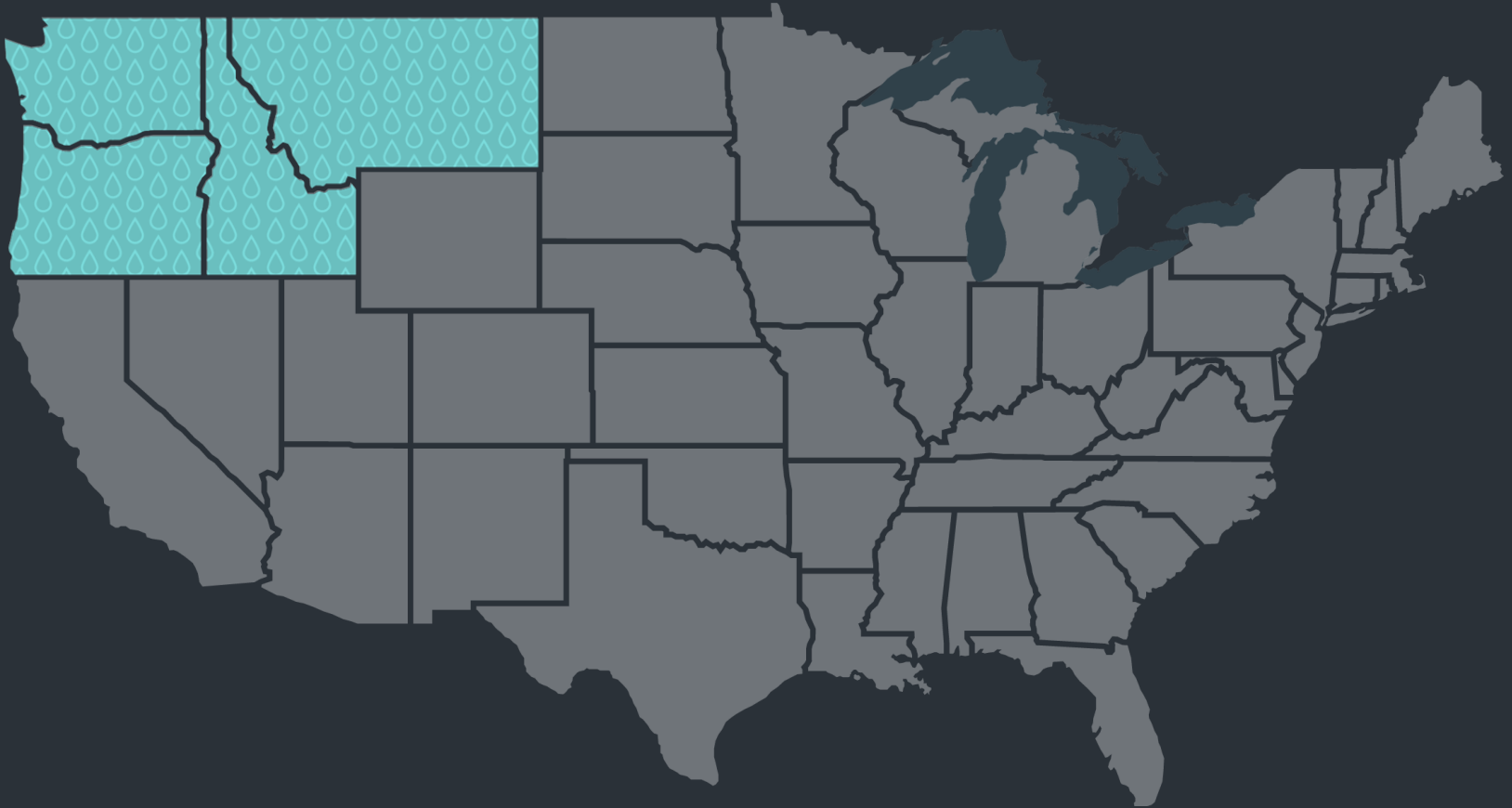




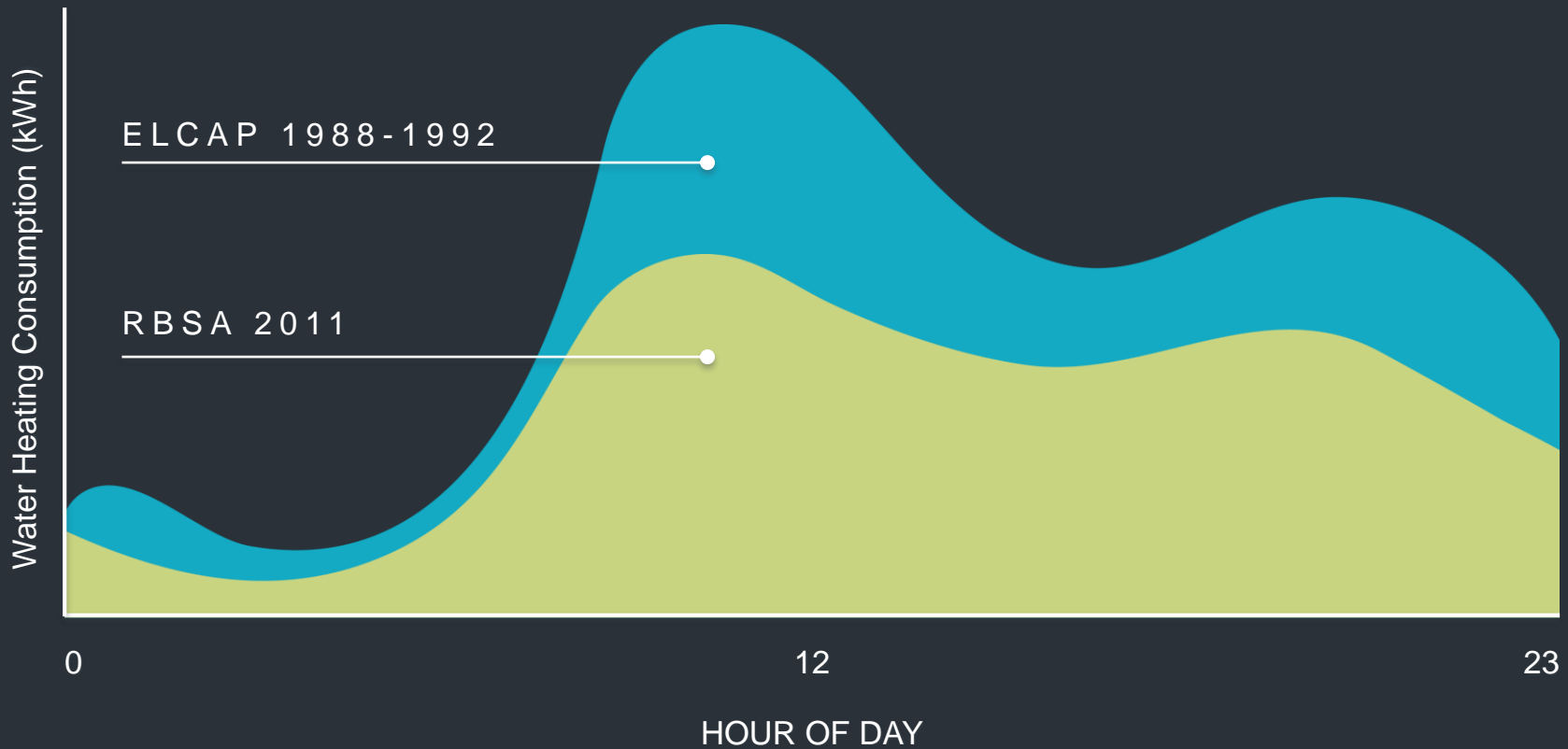
**How is hot water use changing over time?**



# In the Northwest

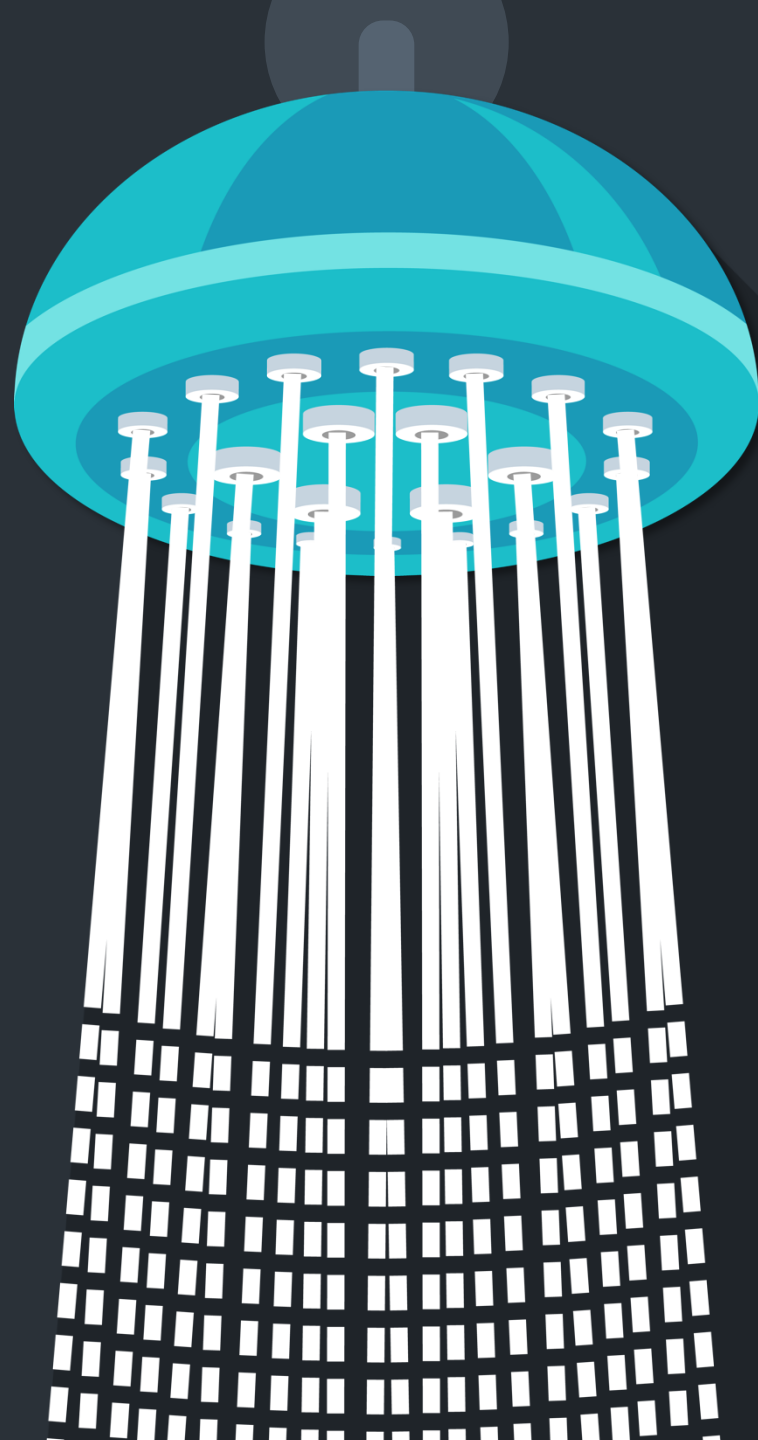


# Northwest water heating consumption is less than 20 years ago



# Why is consumption dropping?

...We don't know,  
but we do have  
some clues from  
existing data



# Bathroom aerators are getting more efficient

Flow rates are decreasing in single-family homes



MID-2000'S  
MEASURED FLOW RATE

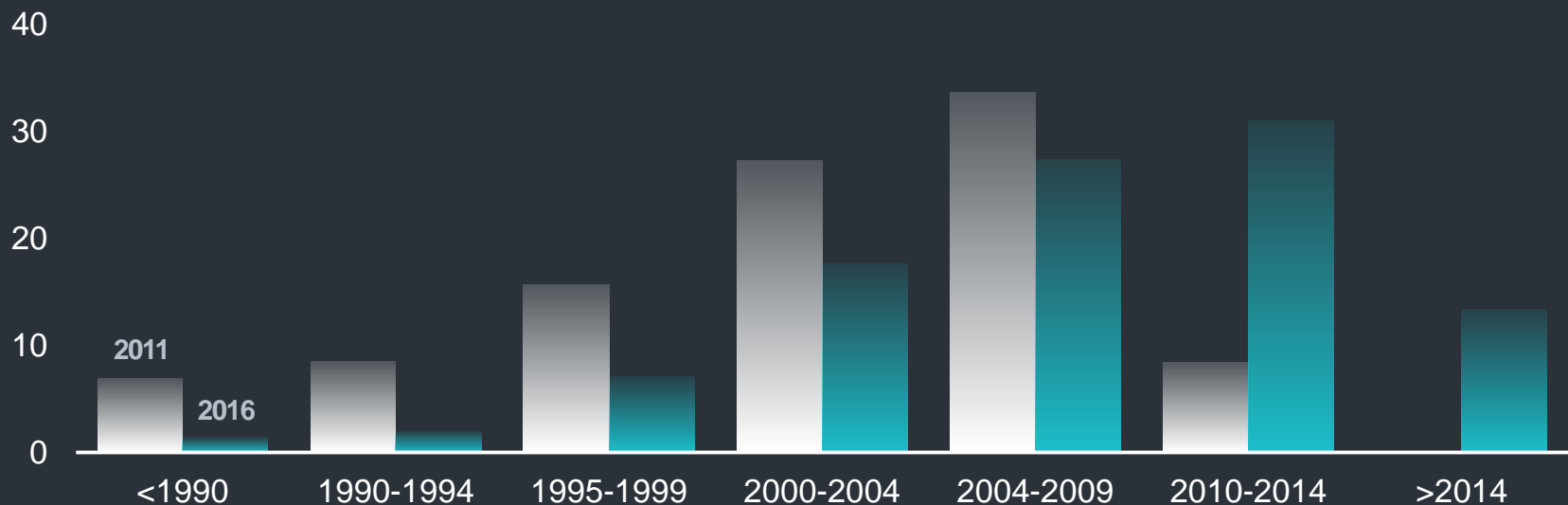


2016 SINGLE-FAMILY  
MEASURED FLOW RATES

Source: Energy Trust of Oregon Blessing Memo for Faucet Aerators, "ETO CEC 2015 Customizable Energy Saver Kits-140822 REVISED", as presented in 7th Plan Aerator Conservation Supply Curve Workbook (Res-Aerator-7P\_v5.xlsx)

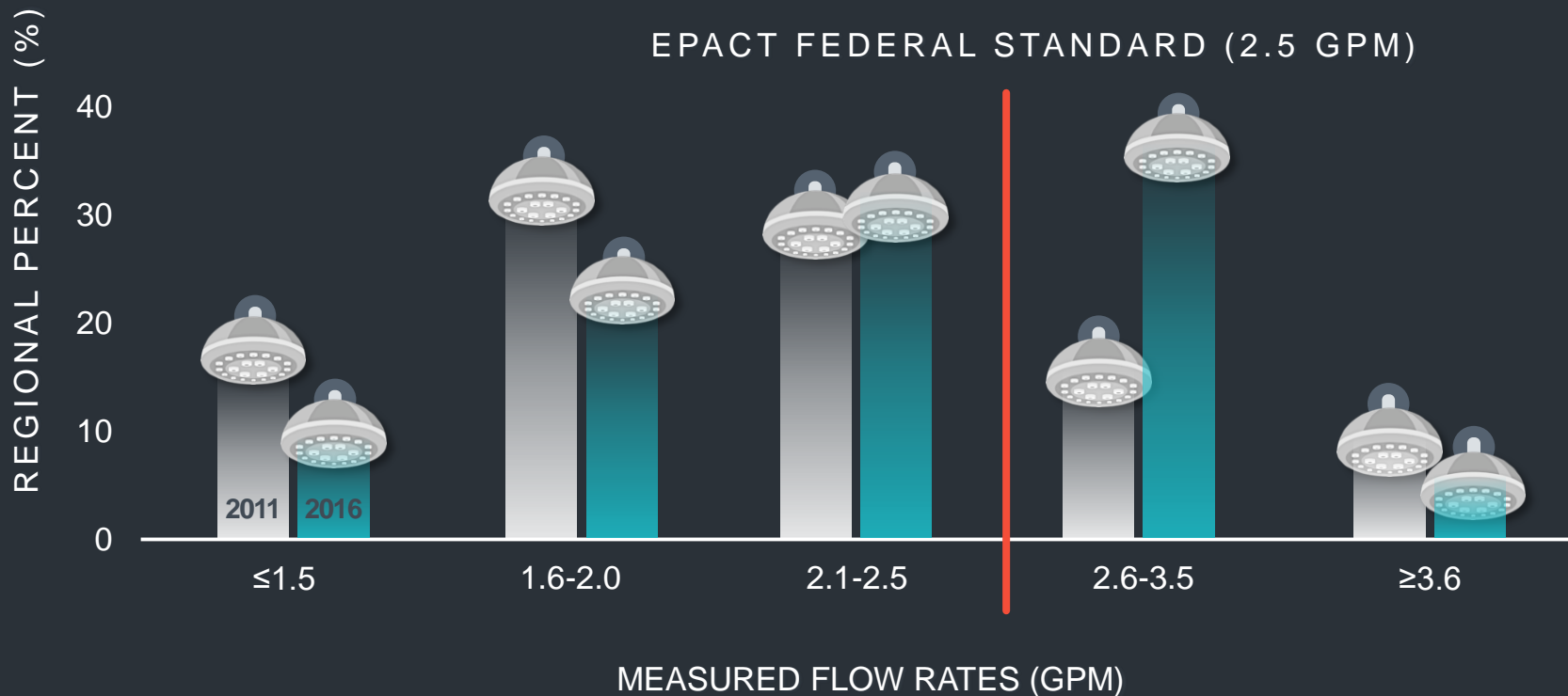
# Old and inefficient *clothes washers* are becoming less common

DISTRIBUTION OF CLOTHES WASHERS BY VINTAGE  
REGIONAL PERCENT (%)

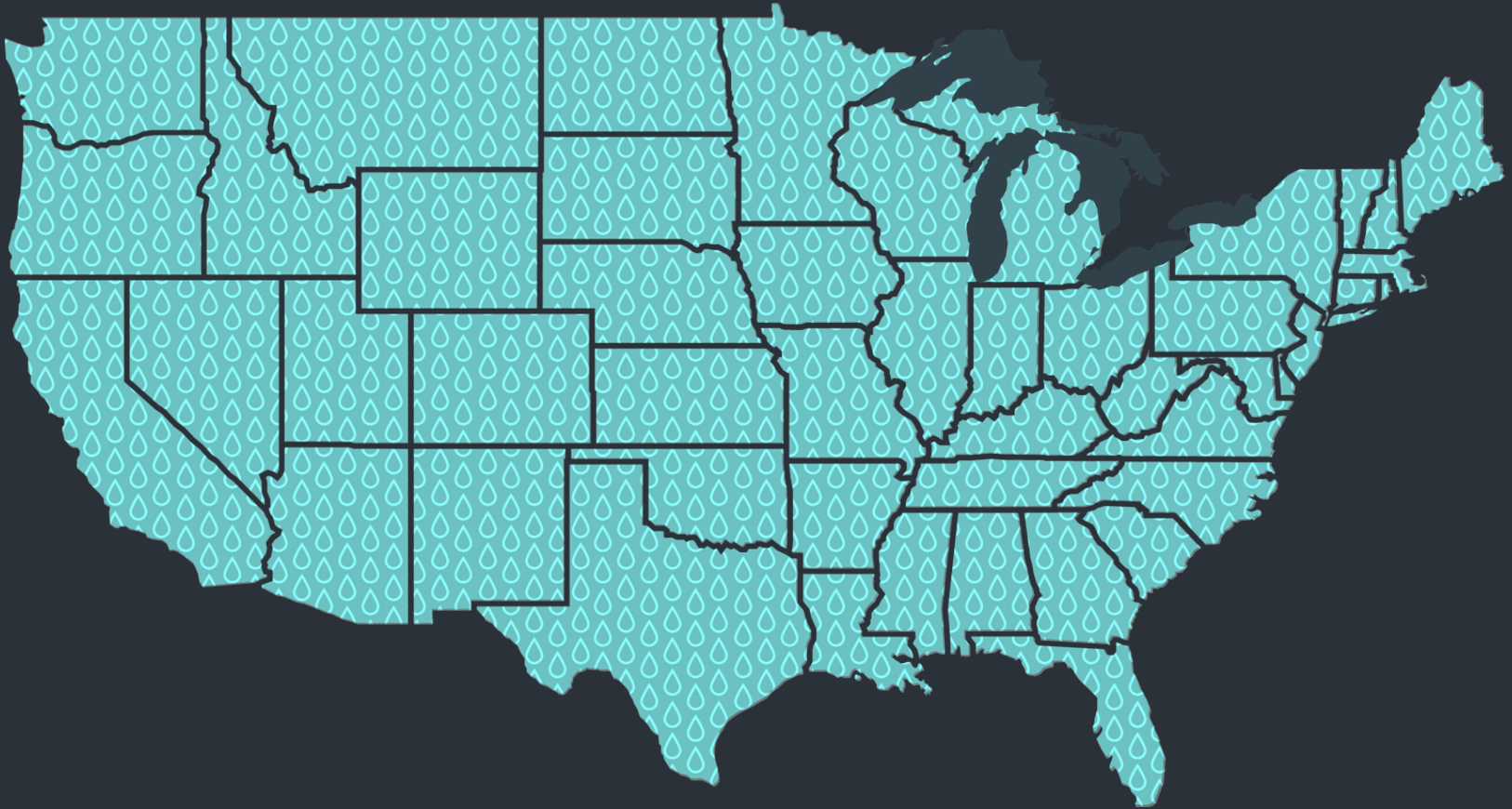


# However, *showerheads* are getting less efficient

Decrease in efficient showerheads 2011-2016

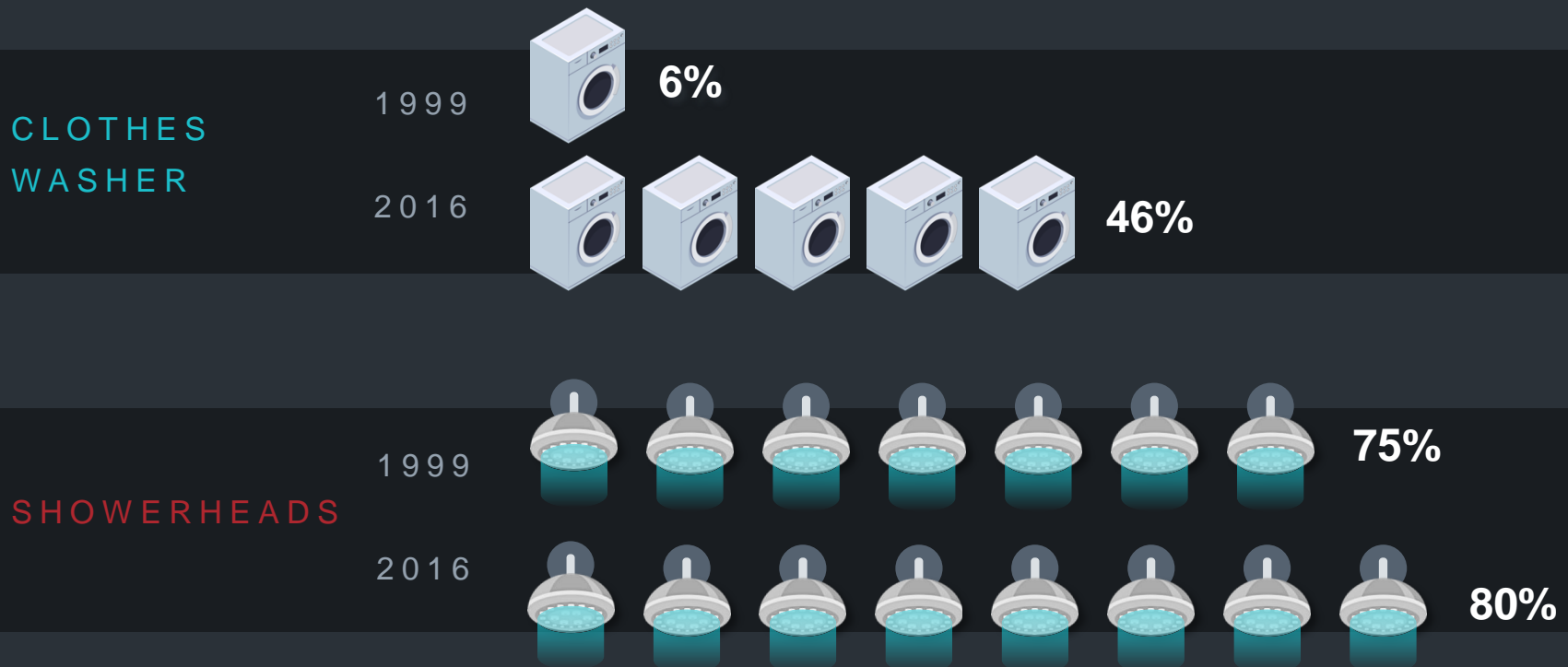


# Nationally, how is hot water use changing?



# We're getting more efficient, nationally

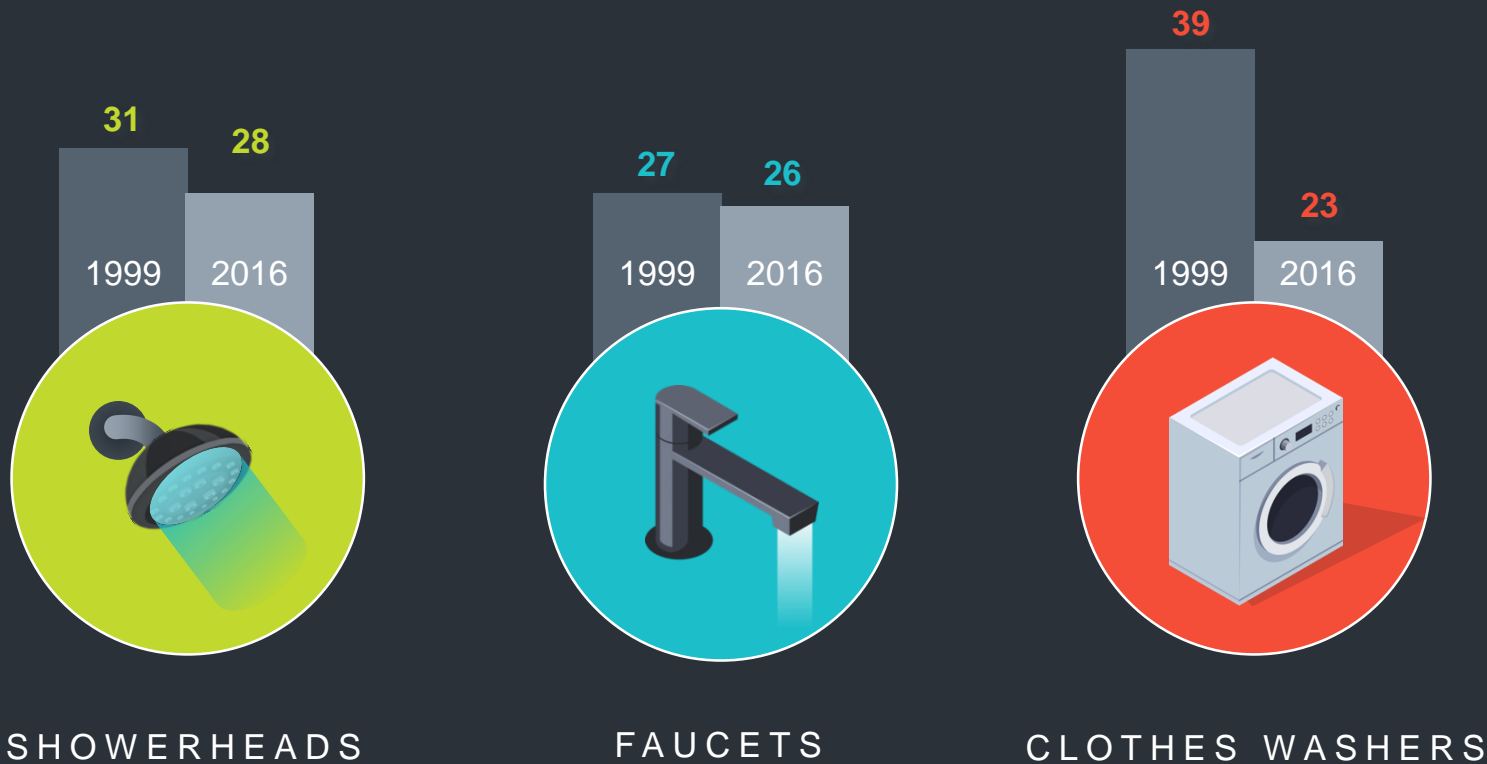
PERCENT OF HOMES MEETING EFFICIENCY CRITERIA  
REU 1999 AND REU 2016





# People are *probably* using less hot water

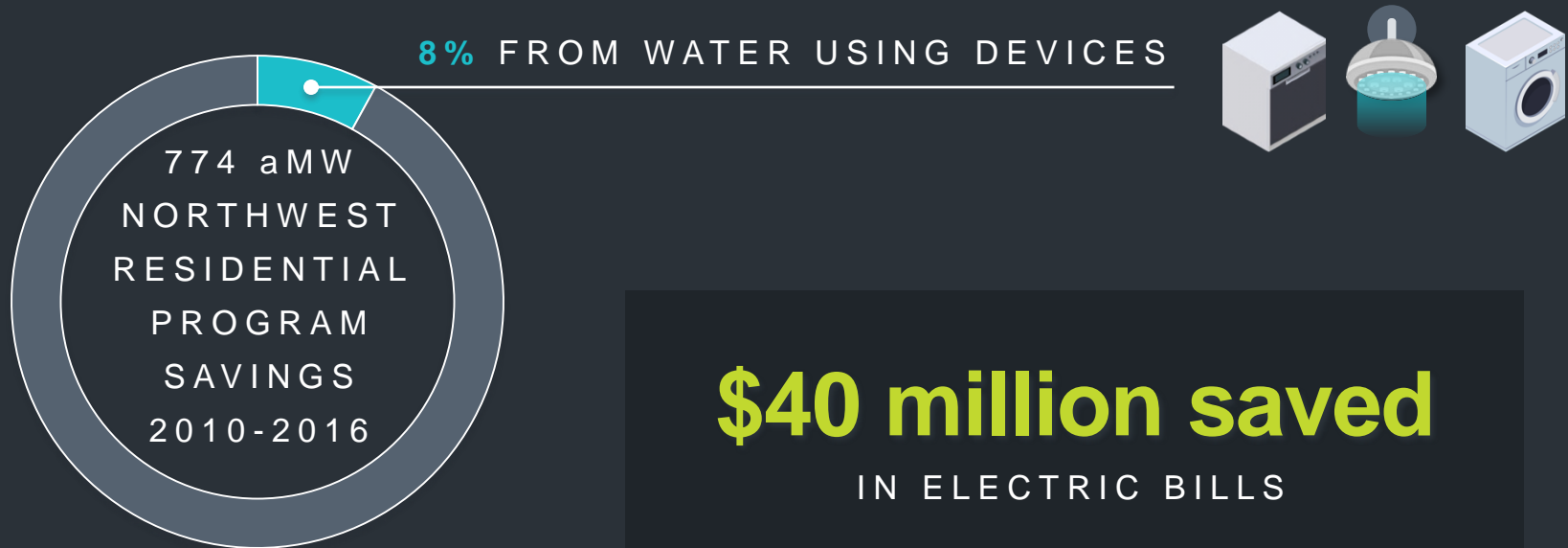
TOTAL (MIXED) HOUSEHOLD WATER USE  
GALLONS PER DAY (GPD)



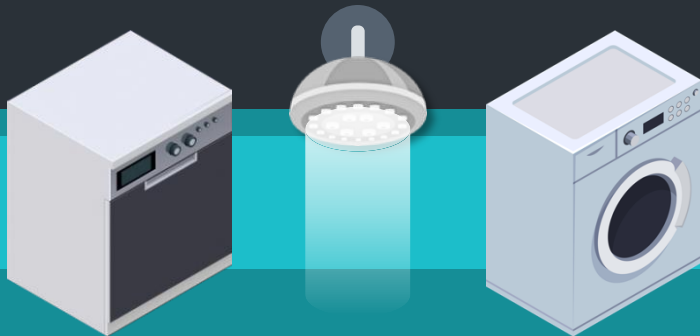


**How successful  
have efficiency  
programs been?**

# In the Northwest, programs have been important



# Hot water use devices have saved most of the water heating energy to date



HOT WATER USE  
DEVICES

**64 aMW saved**

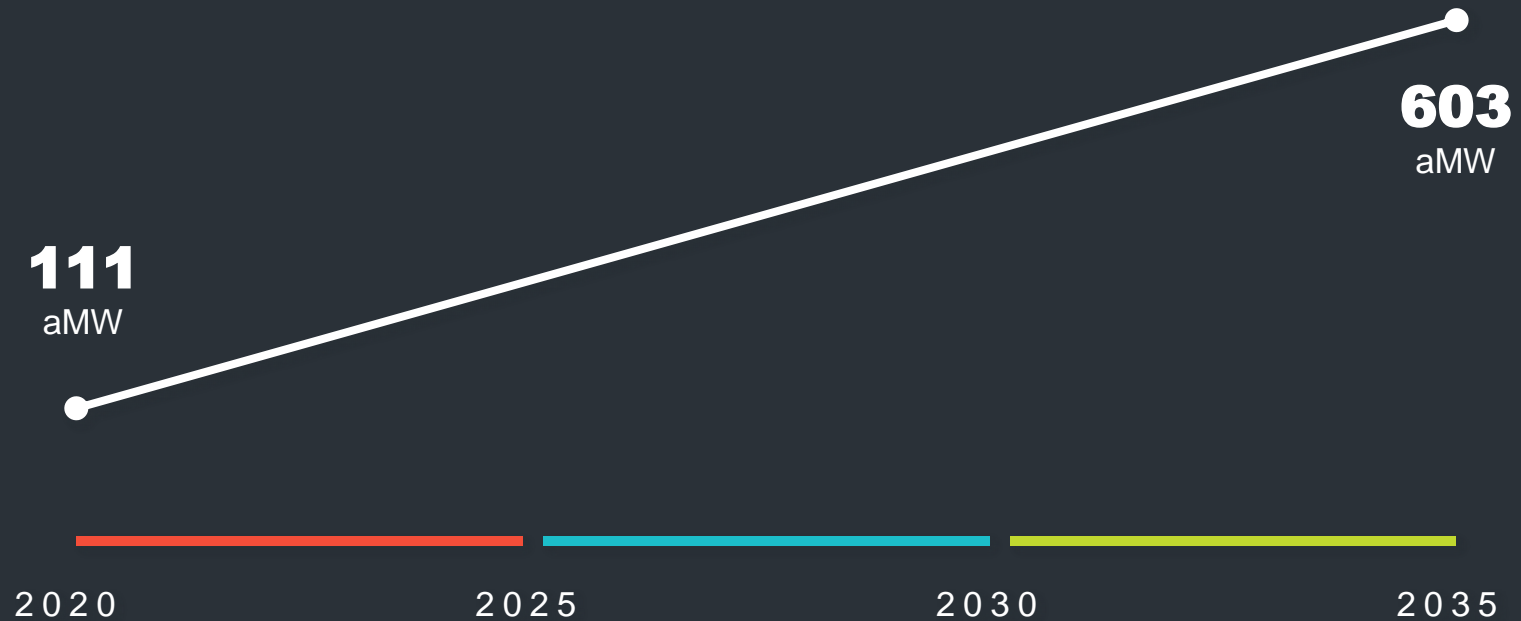


WATER HEATING  
EQUIPMENT

**6 aMW saved**

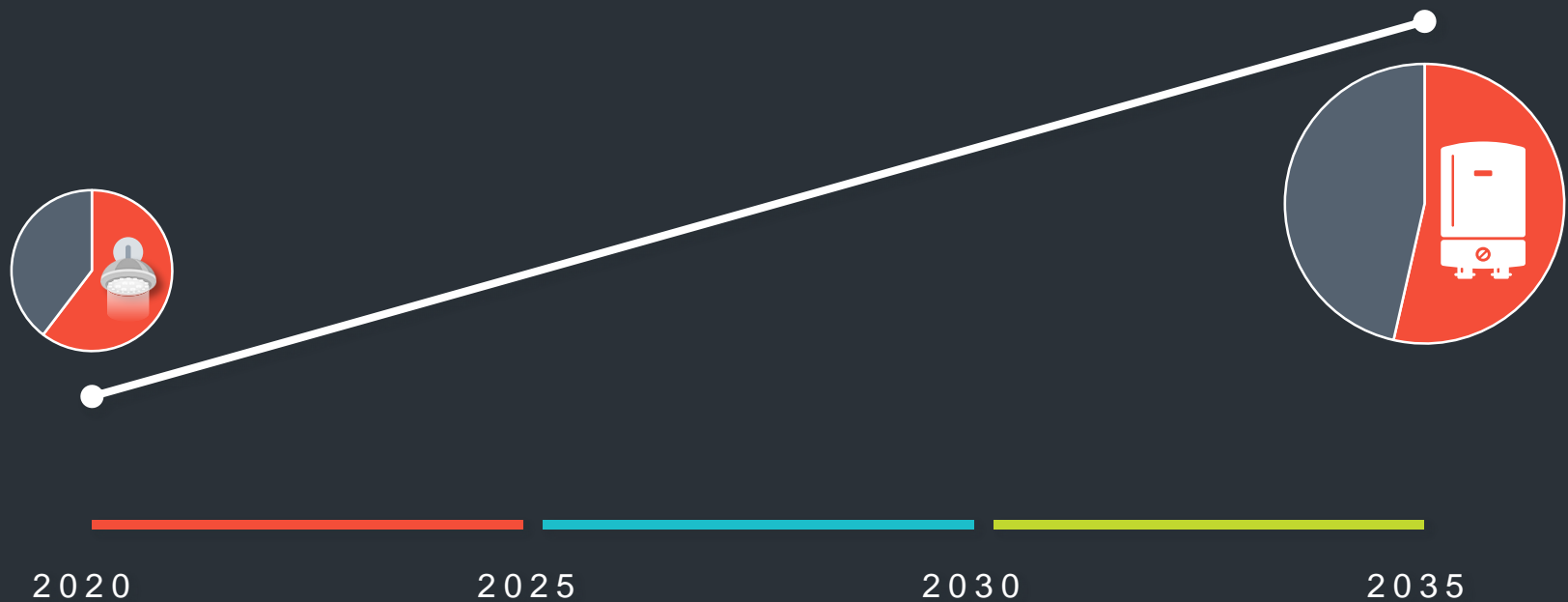
# But there's more work to do

## Northwest Power and Conservation Council 7th Power Plan Maximum Achievable Technical Potential



# But there's more work to do

## Northwest Power and Conservation Council 7th Power Plan Maximum Achievable Technical Potential



# What's Next



**Jim Lutz**

HOT WATER  
RESEARCH

*Are there savings in lower  
GPM showerheads?*



**Troy Sherman**

EVOLVE  
TECHNOLOGIES

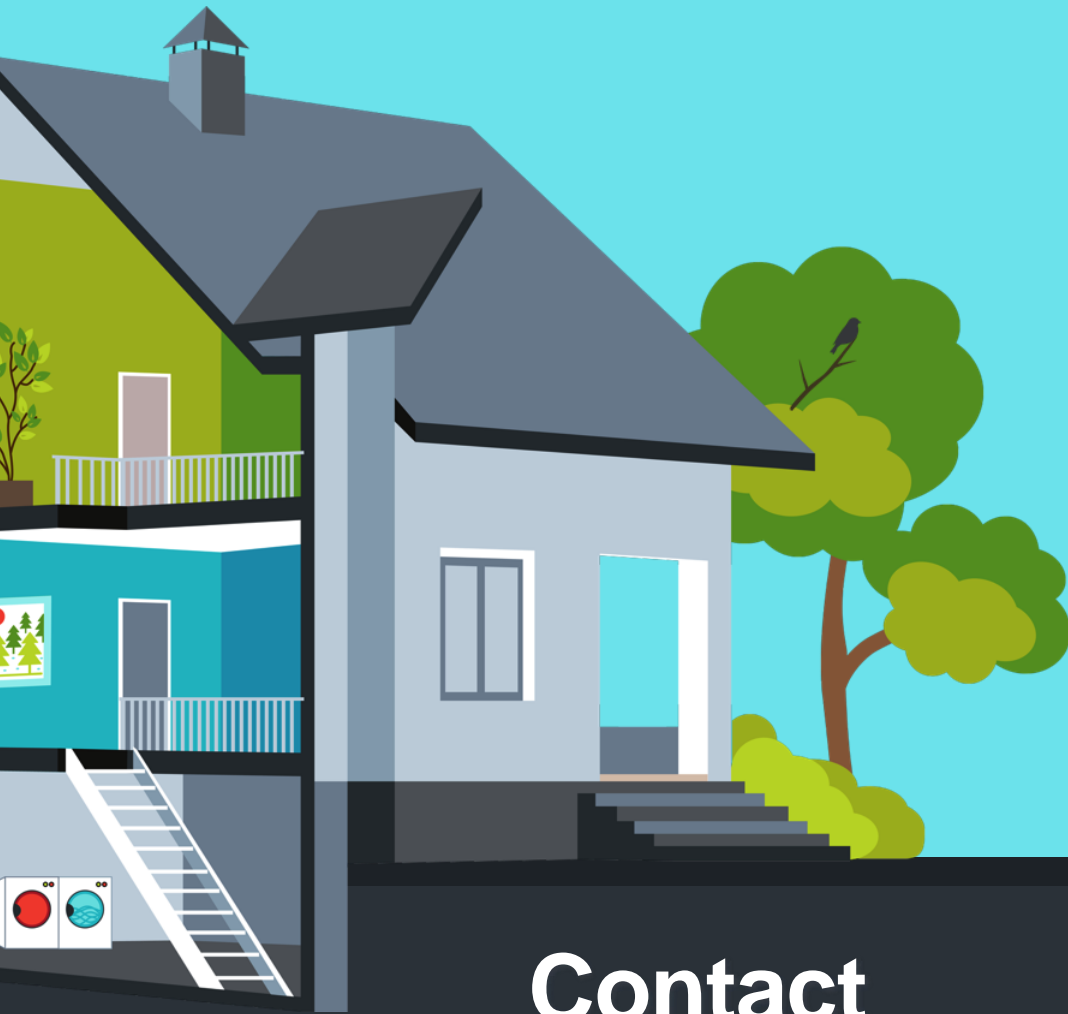
*How low can we go in  
existing buildings?*



**Gary Klein**

GARY KLEIN  
ASSOCIATES

*How low can we go on  
hot water flow rates and  
use in new buildings?*



# Be thinking about...

What will make us successful at reducing hot water consumption over the next 5 years?

How can we create the biggest impact with the least amount of effort?

## Contact

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